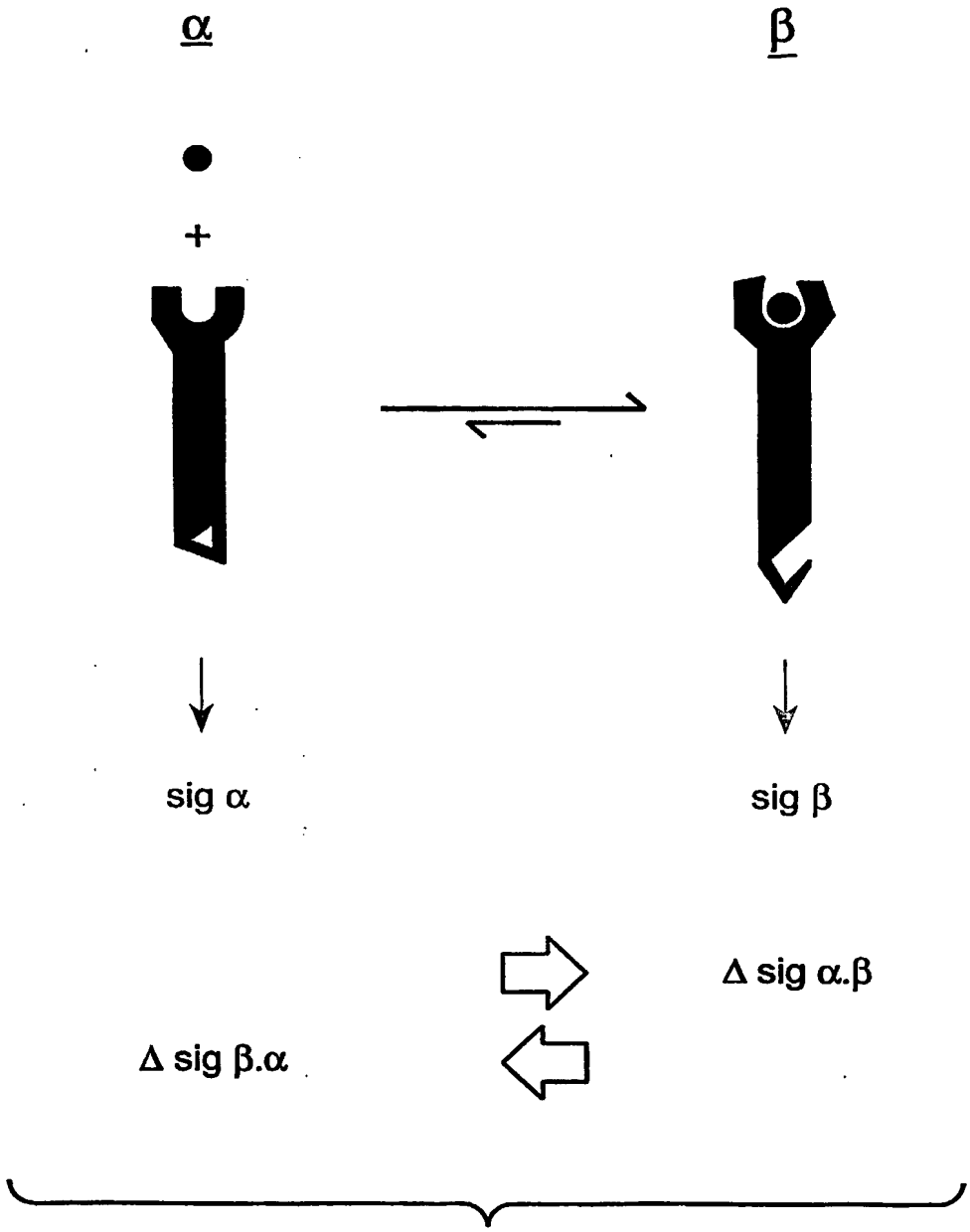


FIG._1

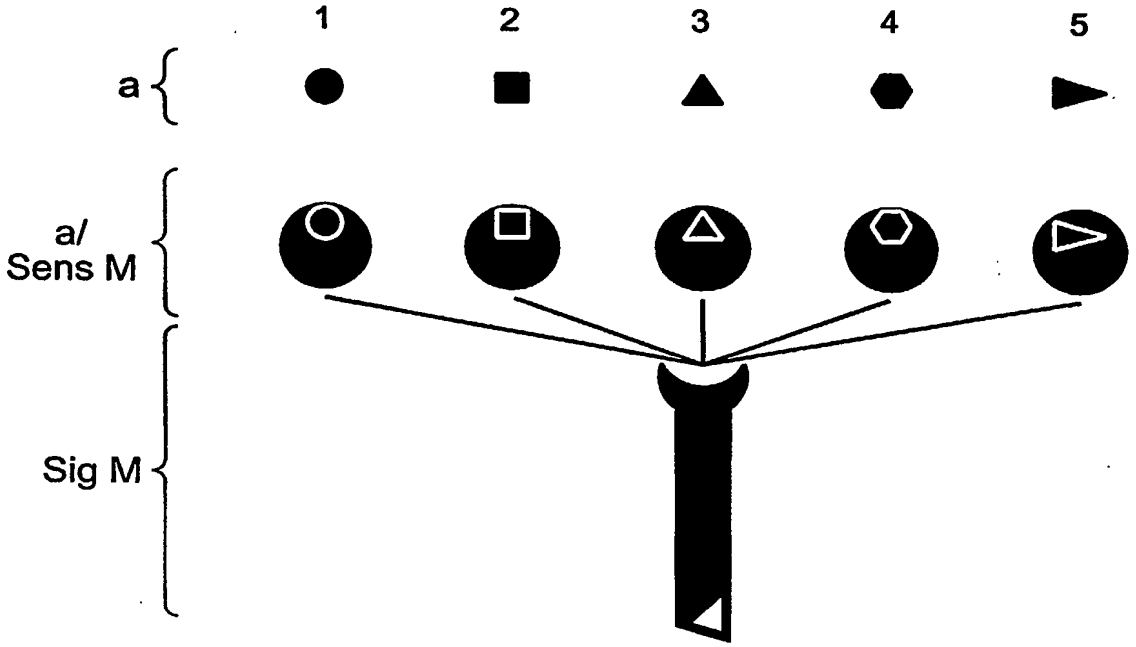


FIG._2

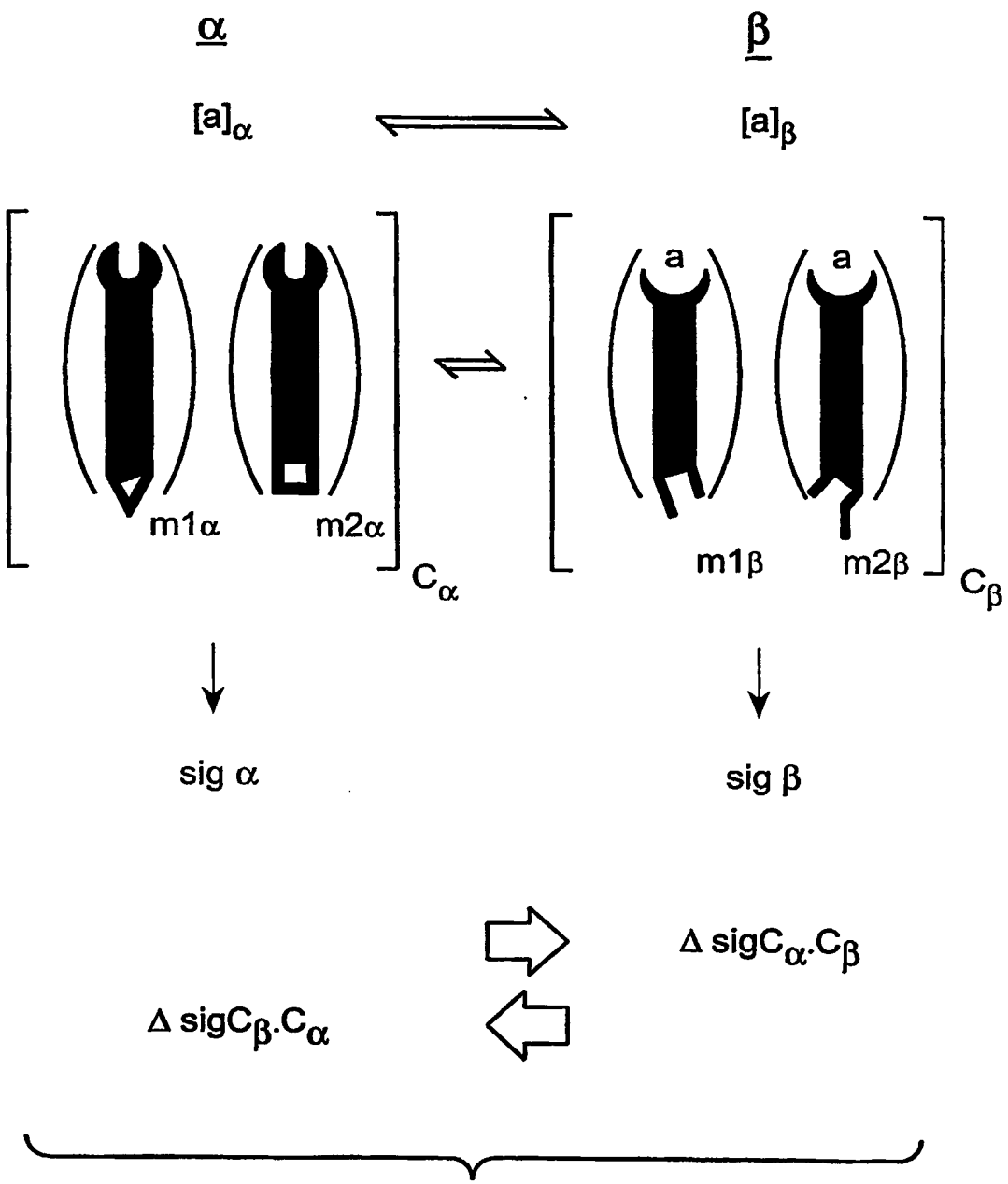


FIG._3

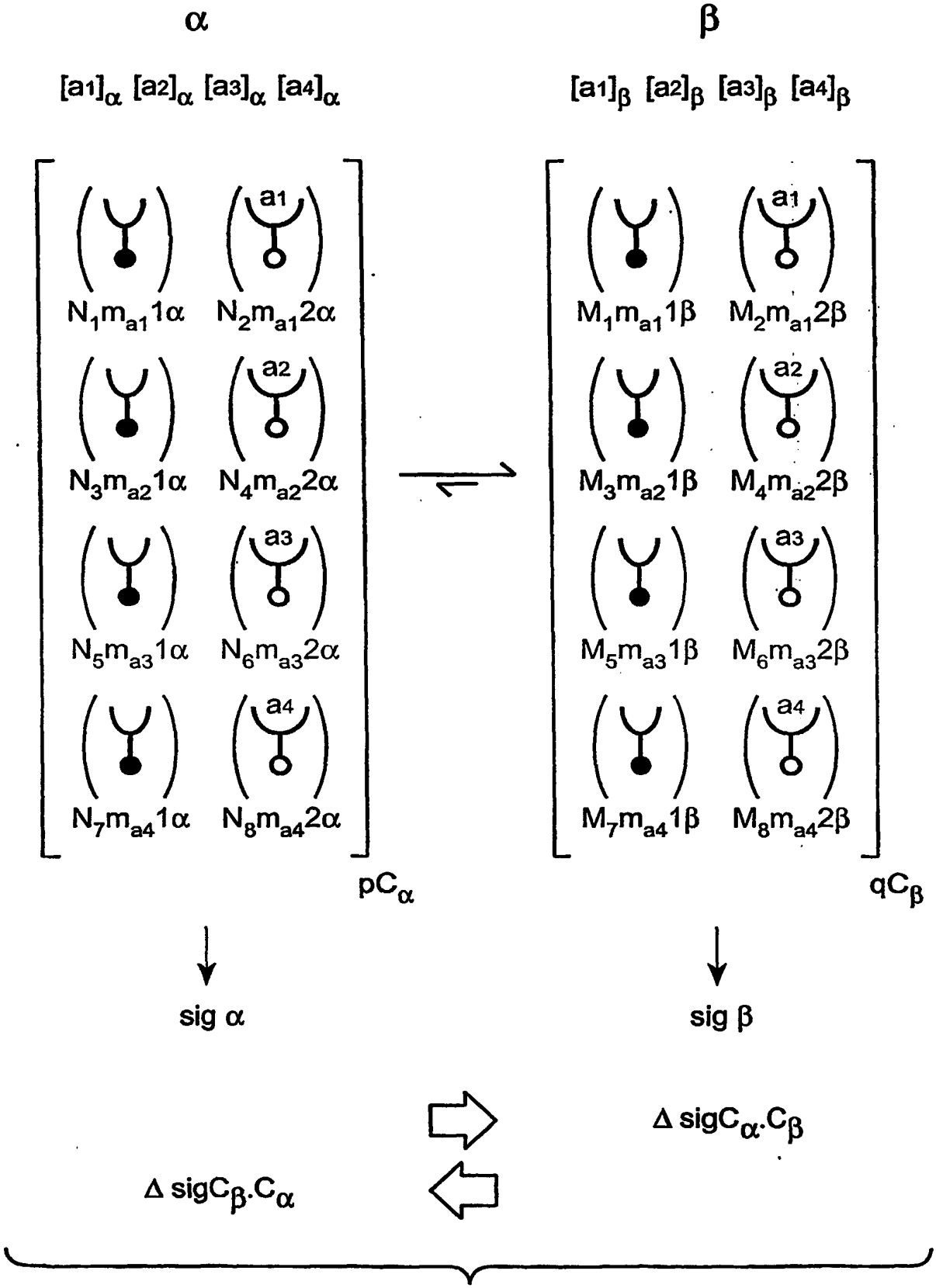

α
β
[a1]α [a2]α [a3]α [a4]α
[a1]β [a2]β [a3]β [a4]β
N1ma1 1α
N2ma1 2α
N3ma2 1α
N4ma2 2α
N5ma3 1α
N6ma3 2α
N7ma4 1α
N8ma4 2α
M1ma1 1β
M2ma1 2β
M3ma2 1β
M4ma2 2β
M5ma3 1β
M6ma3 2β
M7ma4 1β
M8ma4 2β
pCα
qCβ
sig α
sig β
Δ sigCα.Cβ
Δ sigCβ.Cα

FIG._4

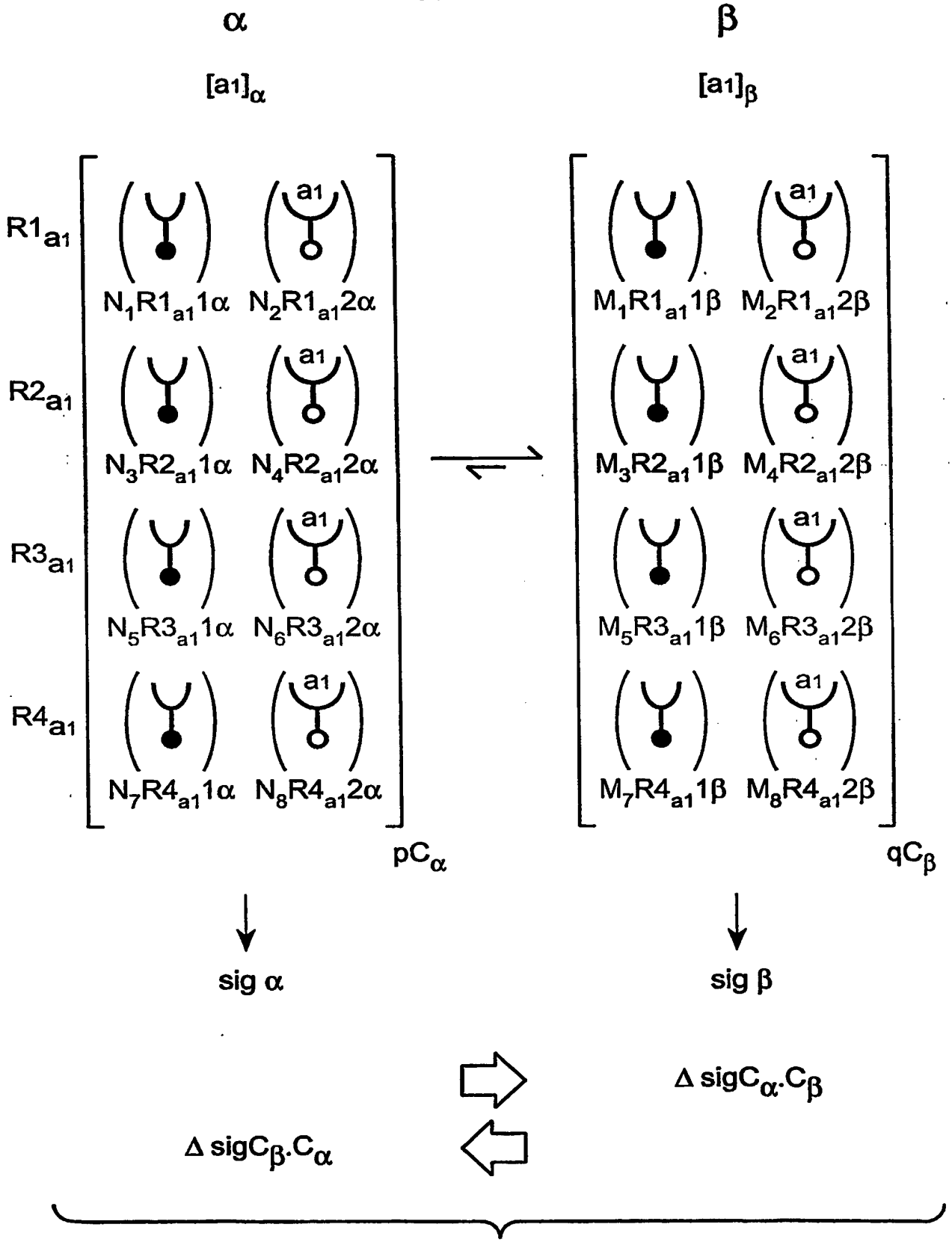

α
β
[a1]α
[a1]β
R1a1
R2a1
R3a1
R4a1
N1R1a1 1α
N2R1a1 2α
N3R2a1 1α
N4R2a1 2α
N5R3a1 1α
N6R3a1 2α
N7R4a1 1α
N8R4a1 2α
M1R1a1 1β
M2R1a1 2β
M3R2a1 1β
M4R2a1 2β
M5R3a1 1β
M6R3a1 2β
M7R4a1 1β
M8R4a1 2β
pCα
qCβ
sig α
sig β
Δ sigCα.Cβ
Δ sigCβ.Cα

FIG._5

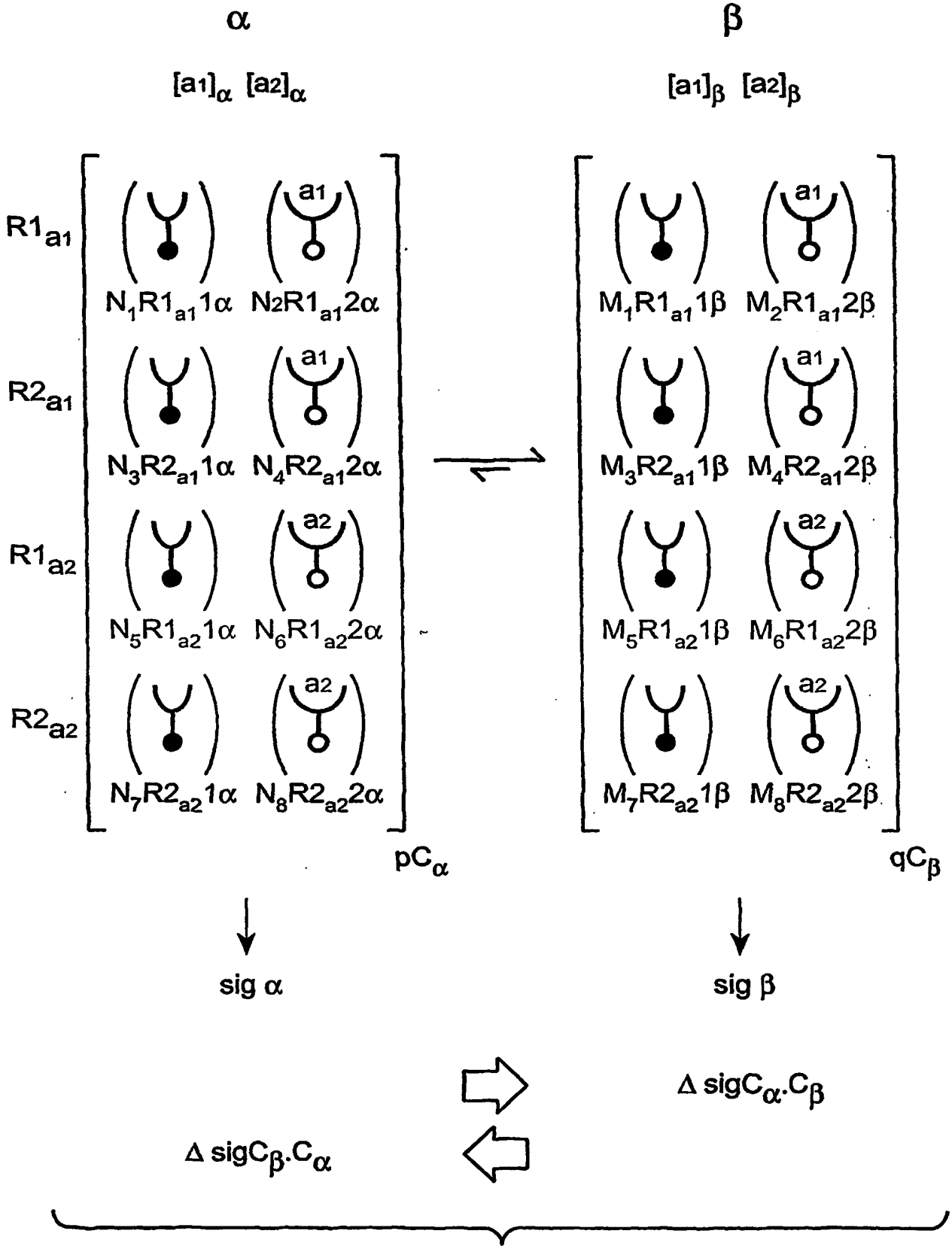

α
β
$[a_1]_\alpha$ $[a_2]_\alpha$
$[a_1]_\beta$ $[a_2]_\beta$
$R1_{a1}$
$R2_{a1}$
$R1_{a2}$
$R2_{a2}$
$N_1R1_{a1}1\alpha$ $N_2R1_{a1}2\alpha$
$N_3R2_{a1}1\alpha$ $N_4R2_{a1}2\alpha$
$N_5R1_{a2}1\alpha$ $N_6R1_{a2}2\alpha$
$N_7R2_{a2}1\alpha$ $N_8R2_{a2}2\alpha$
$M_1R1_{a1}1\beta$ $M_2R1_{a1}2\beta$
$M_3R2_{a1}1\beta$ $M_4R2_{a1}2\beta$
$M_5R1_{a2}1\beta$ $M_6R1_{a2}2\beta$
$M_7R2_{a2}1\beta$ $M_8R2_{a2}2\beta$
pC_α
qC_β
sig α
sig β
$\Delta sigC_\alpha.C_\beta$
$\Delta sigC_\beta.C_\alpha$

FIG._6

α

$[a_1]_\alpha$

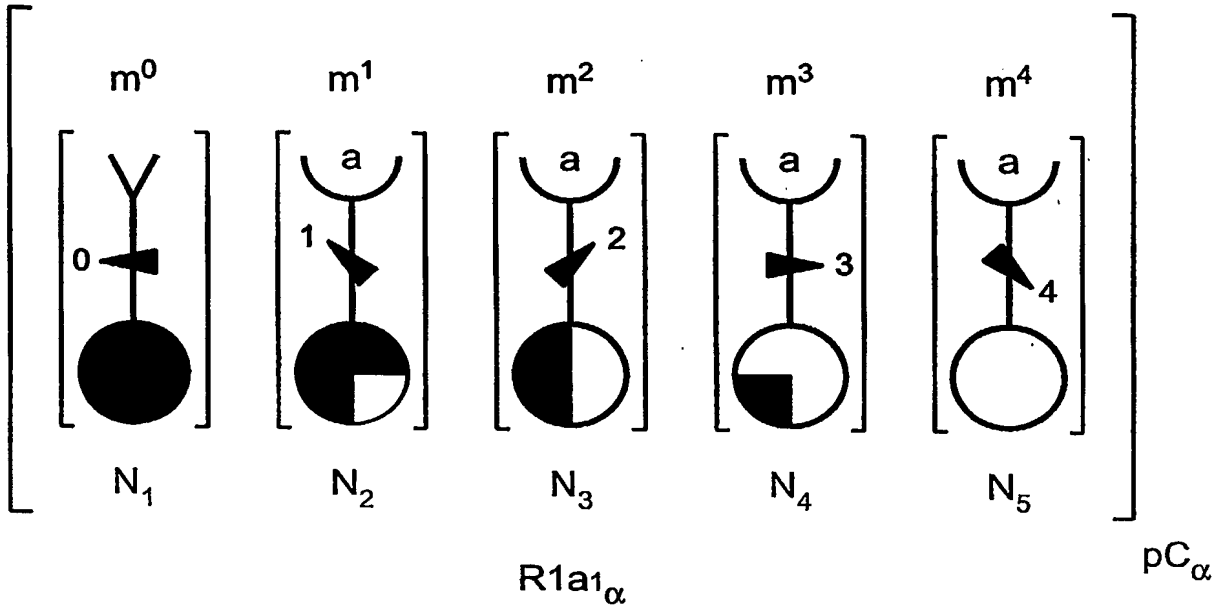


FIG._7

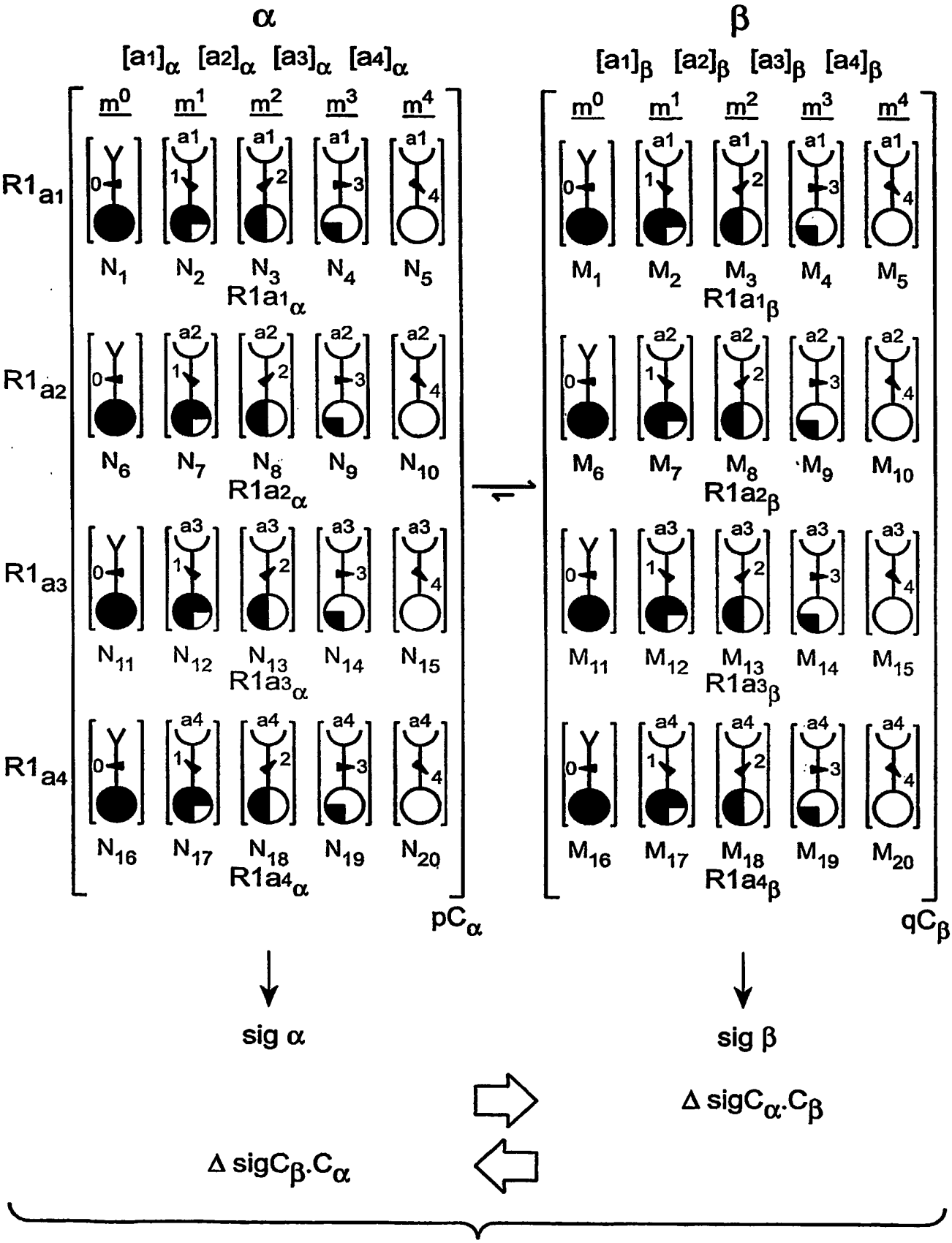

α
β
$[a1]_\alpha$ $[a2]_\alpha$ $[a3]_\alpha$ $[a4]_\alpha$
$[a1]_\beta$ $[a2]_\beta$ $[a3]_\beta$ $[a4]_\beta$
m^0 m^1 m^2 m^3 m^4
$R1_{a1}$
$R1_{a2}$
$R1_{a3}$
$R1_{a4}$
N_1 N_2 N_3 N_4 N_5
$R1a1_\alpha$
N_6 N_7 N_8 N_9 N_{10}
$R1a2_\alpha$
N_{11} N_{12} N_{13} N_{14} N_{15}
$R1a3_\alpha$
N_{16} N_{17} N_{18} N_{19} N_{20}
$R1a4_\alpha$
pC_α
M_1 M_2 M_3 M_4 M_5
$R1a1_\beta$
M_6 M_7 M_8 M_9 M_{10}
$R1a2_\beta$
M_{11} M_{12} M_{13} M_{14} M_{15}
$R1a3_\beta$
M_{16} M_{17} M_{18} M_{19} M_{20}
$R1a4_\beta$
qC_β
sig α
sig β
$\Delta sigC_\alpha.C_\beta$
$\Delta sigC_\beta.C_\alpha$

FIG._8

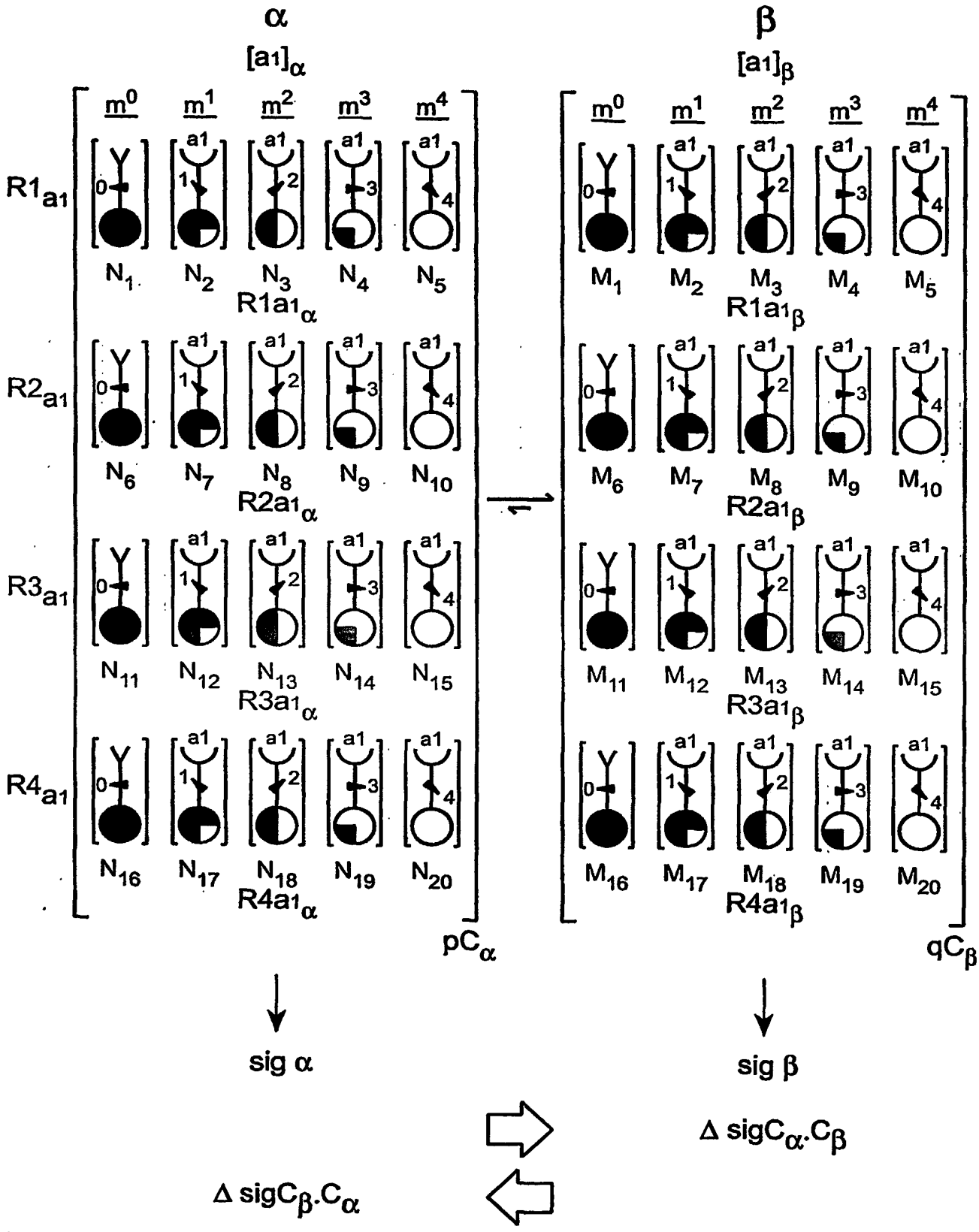

α
[a1]α
β
[a1]β
m0 m1 m2 m3 m4
R1a1
R2a1
R3a1
R4a1
N1 N2 N3 N4 N5
R1a1α
N6 N7 N8 N9 N10
R2a1α
N11 N12 N13 N14 N15
R3a1α
N16 N17 N18 N19 N20
R4a1α
pCα
M1 M2 M3 M4 M5
R1a1β
M6 M7 M8 M9 M10
R2a1β
M11 M12 M13 M14 M15
R3a1β
M16 M17 M18 M19 M20
R4a1β
qCβ
sig α
sig β
Δ sigCβ.Cα
Δ sigCα.Cβ

FIG._9

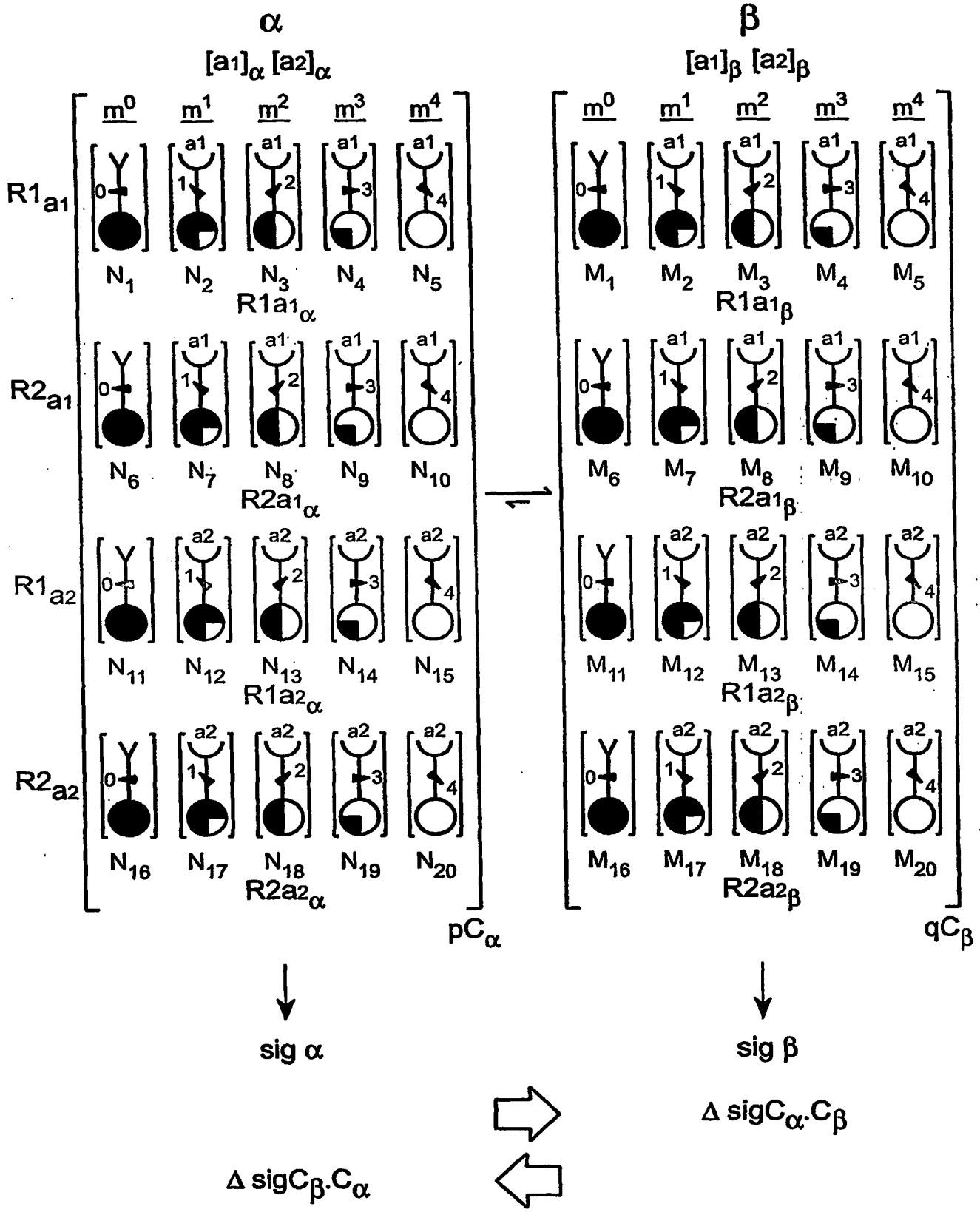

α
[a1]α [a2]α
β
[a1]β [a2]β
m0 m1 m2 m3 m4
R1a1
R2a1
R1a2
R2a2
N1 N2 N3 N4 N5
R1a1α
N6 N7 N8 N9 N10
R2a1α
N11 N12 N13 N14 N15
R1a2α
N16 N17 N18 N19 N20
R2a2α
pCα
M1 M2 M3 M4 M5
R1a1β
M6 M7 M8 M9 M10
R2a1β
M11 M12 M13 M14 M15
R1a2β
M16 M17 M18 M19 M20
R2a2β
qCβ
sig α
sig β
Δ sigCα.Cβ
Δ sigCβ.Cα

FIG. 10

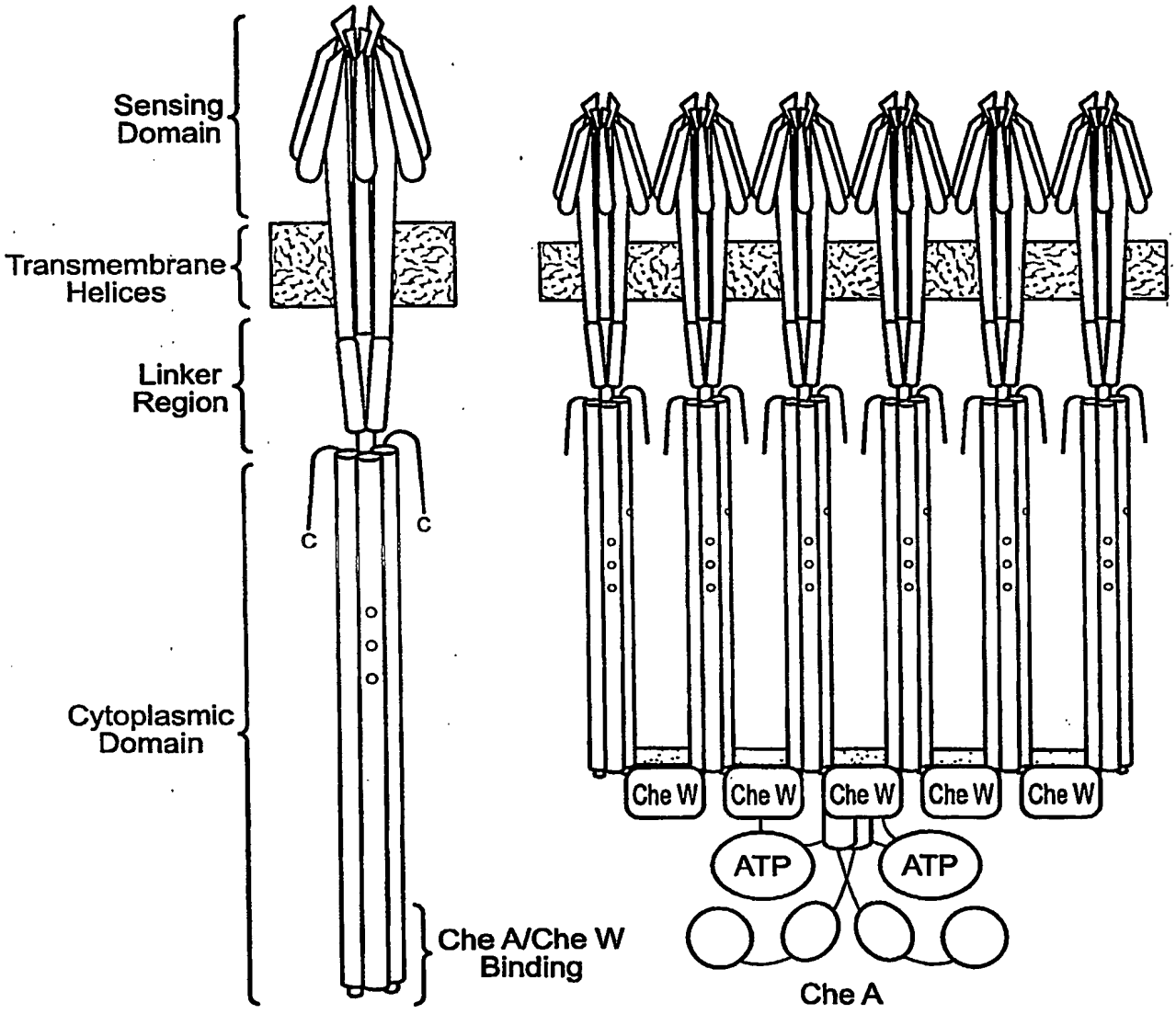

Sensing Domain
Transmembrane Helices
Linker Region
Cytoplasmic Domain
C
C
Che A/Che W Binding
Che W
Che W
Che W
Che W
Che W
ATP
ATP
Che A

FIG._11

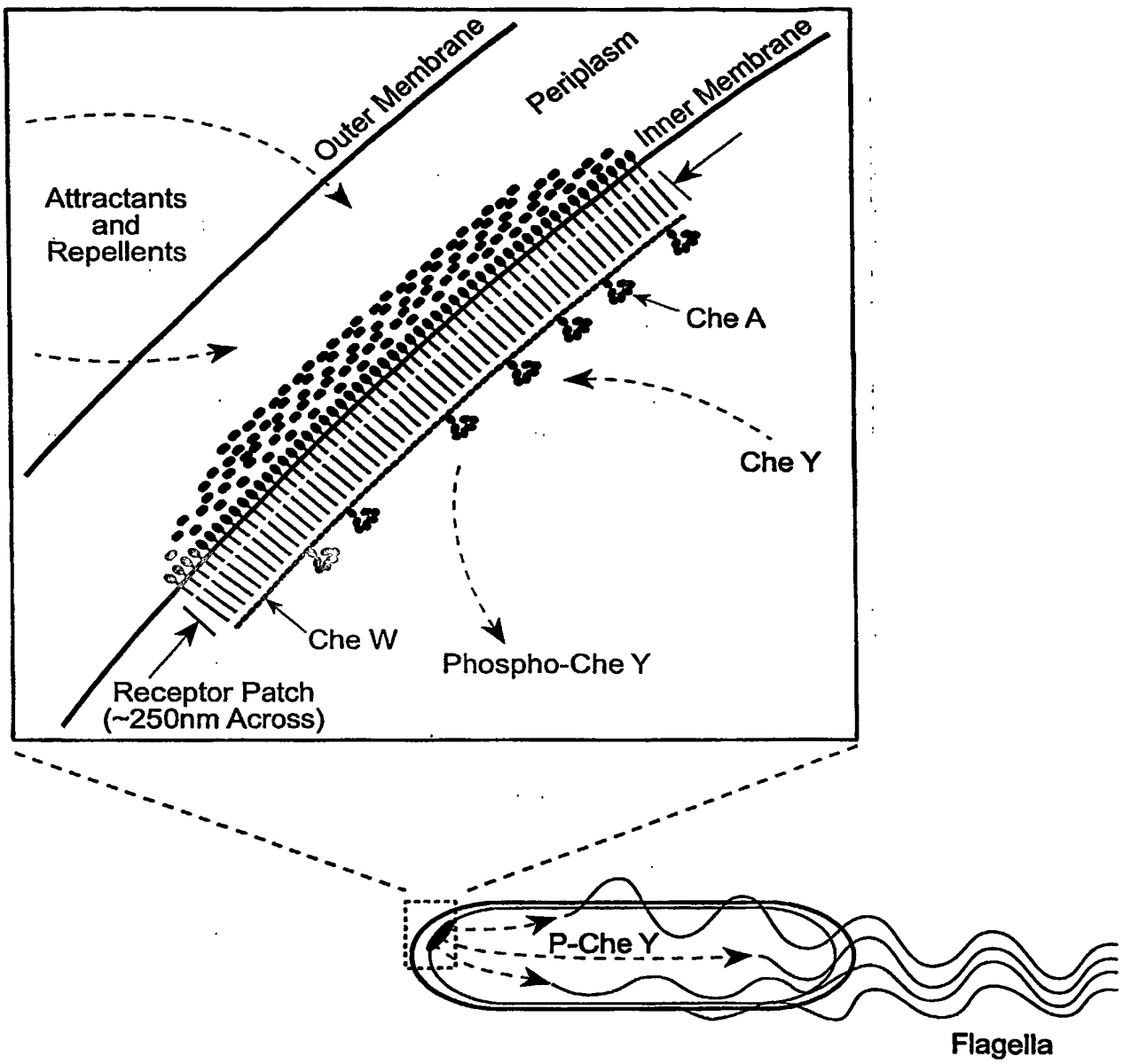
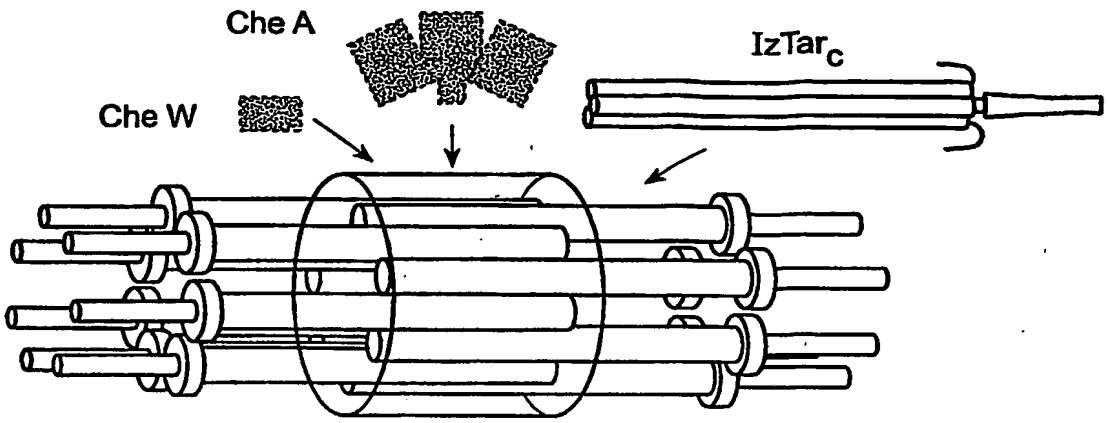

Outer Membrane
Periplasm
Inner Membrane
Attractants
and
Repellents
Che A
Che Y
Che W
Phospho-Che Y
Receptor Patch
(~250nm Across)
P-Che Y
Flagella

FIG._12


Che A
Che W
IzTar$_c$

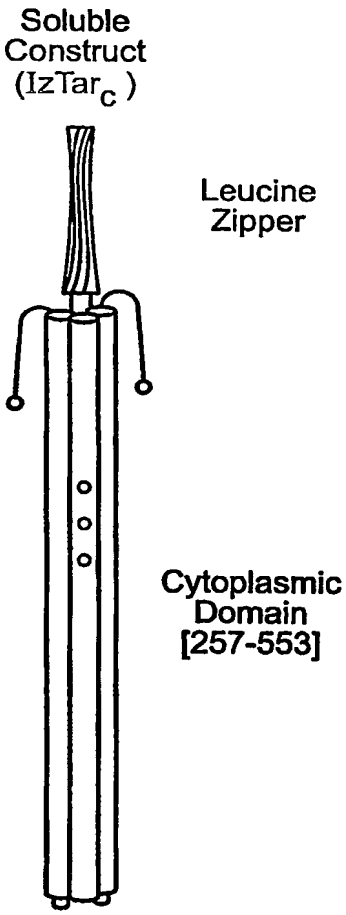
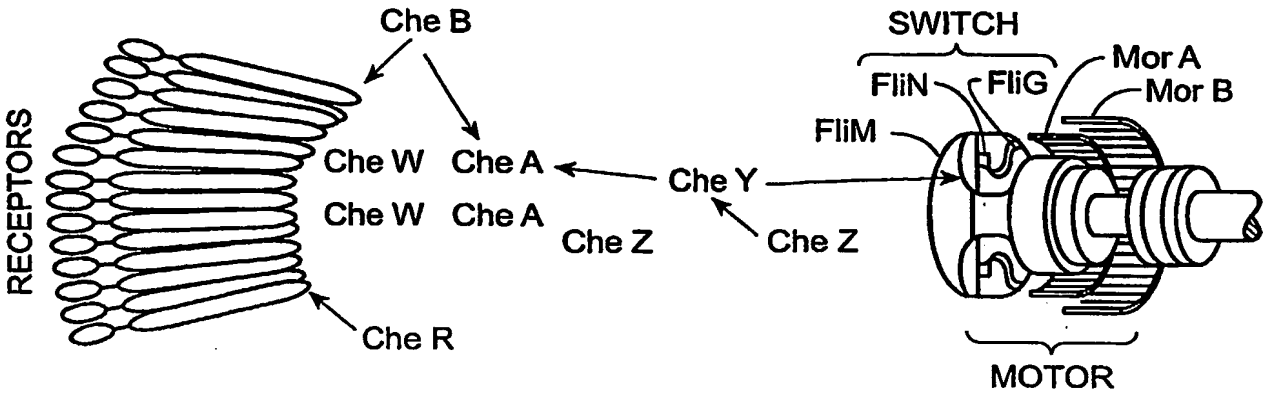

Soluble
Construct
(IzTar$_c$)
Leucine
Zipper
Cytoplasmic
Domain
[257-553]

FIG._13


Che B
SWITCH
Mor A
FliN
FliG
Mor B
FliM
RECEPTORS
Che W
Che A
Che Y
Che W
Che A
Che Z
Che Z
Che R
MOTOR

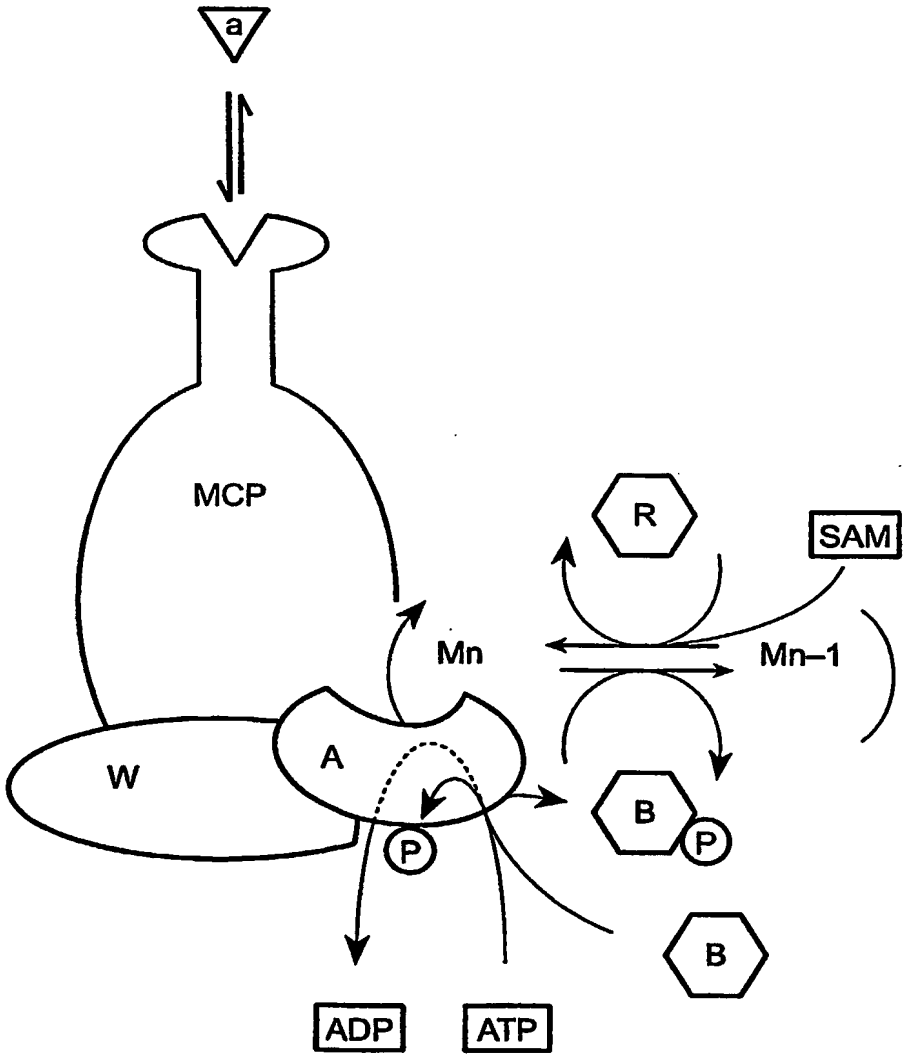

a
MCP
R
SAM
Mn
Mn–1
W
A
B
P
P
B
ADP
ATP

FIG._14